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PRESENT DAY CONCEPT OF RHEUMATOID ARTHRITIS AND ALLIED DISEASES*

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IN CONFORMING WITH the present knowledge of these diseases, they shall have to be discussed as Collagen Degeneration Diseases, or "systemic diseases of the connective tissue" or "diffuse collagen disease" as these disorders of the connective tissue have been designated by Klemperer and Baehr and Pollack and their associates.

Other diseases than Rheumatoid Arthritis usually included in this category of collagen disorders are: disseminated lupus erythematosis, periarteritis nodosa, scleroderma, dermatomyositis, and rheumatic fever.

Diseases showing similar histological alterations are: thrombo-angitis obliterans, erythema nodosum, anaphylactoid purpura, and serum sickness.

At first glance there seems to be little relationship between these groups of diseases, yet recent work has shown that the manifestations of these diseases frequently overlap one another. In order to obtain a fairly comprehensive idea of these disorders, we shall approach the subject from three points of view: (1) The Histophysiology of Connective Tissue, with a discussion of their anatomical role and function. (2) The Relation of Connective Tissue Substances to Rheumatic Disease, taking into consideration the Hyaluronidase activity in Rheumatic Fever, and the theory of Tissue-fixation of Antibodies in Rheumatoid Arthritis. (3) The Clinical Manifestations, with emphasis on cardiac involvement and the changes in the protein Metabolism.

A. *Histophysiology of Connective Tissue*

This also includes a discussion of the tissue components and their chemical composition.

The connective tissues of the body are the most widely distributed of all tissue. Their essential role is to connect, support, and bind together the various other tissues and organs of the body. But aside from the mechanical function, they have an important part to play in the nutrition of the organs they hold together. All the products of metabolism and water from the cells that are transferred to the blood and lymph pass through the connective tissues. The extracellular fluid is held principally in the connective tissues or in the intercellular spaces.

The nutritive role of connective tissue is determined by the fact that the blood and lymph vessels of the body are all confined to it. Since most cells do not abut on capillaries, they must be nourished from the connective tissue that separates them from the capillaries. This is explained by the theory that connective tissue so disposed is bathed in tissue fluid that emerges from the capillaries as a dialysate of blood plasma and is returned to the circulatory system by both the blood and lymph capillaries of the connective tissue.

In addition to its nutritive role, the connective tissue plays a defensive role under conditions of infection. It is the arena where all the local reactive processes take place. Pathologic inflammation calls forth an intense reaction on the part of the connective tissue, and the noxious substances and agents are neutralized here.

In addition to the vascular and specific cellular activities associated in the process of inflammation, the intercellular substances of the connective tissue act as a barrier to spread of infection.

a) *Components of Connective Tissue*—

1) Intercellular Substance — consisting of the bulk of the tissue.

a. Amorphous ground substance—called the intercellular cement or collagen. Contains hyaluronic acid, chondroitin sulfate, calcium, ascorbic acid, and mucopolysaccharides.

b. White or Collagenous Fibers—considered as outgrowths from the fibroblasts. The jelly-like mass derived from the fibers is called "collagen."

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*Presented before the Newport Hospital Medical Staff, May, 1952.

c. Yellow or Elastic fibers—Responsible for the stretching and contraction of the connective tissue or its elasticity. They yield a substance called "elastin" upon boiling.

d. Free Cells—Fibroblasts, mesenchymal cells, macrophages (histiocytes), mast cells, plasma cells, lymphoid cells and eosinophiles. The particular function of each cell is unknown but it is known that in many conditions causing anatomical change in the connective tissue, there is an increase in many of these cells.

2) Cellular Substance—
a. Fibroblasts
b. Tendon Cells
c. Cartilage Cells
d. Bone Corpuscles

B. Relation of Connective Tissue Substances to Rheumatic Disease

In rheumatic fever evidence indicates that there may be an increased activity of the enzyme hyaluronidase, while in rheumatoid arthritis there may be an overproductivity of defective connective tissue, both fibrillar and interfibrillar.

a) *Hyaluronidase Activity in Rheumatic Fever*

The permeability of connective tissue is modified by the enzyme hyaluronidase in removing a tissue barrier to fluid diffusion and thus increasing its permeability. This barrier is thought to be a hyaluronic acid gel, a polysaccharide, present in the ground substance of the connective tissue, which undergoes depolymerization in rheumatic fever.

In rheumatic fever the involvement of joint structures is reversible with full recovery. The primary change in the rheumatic nodule occurs in the ground substance with secondary changes in the fibrillar elements.

The onset of rheumatic fever is intimately associated with infection of Group A hemolytic streptococcus and these organisms alone of the human pathogens produce hyaluronidase and the streptococcal antihyaluronidase in the sera of these patients is increased. Group A streptococcus has been found capable of producing, at least, eight substances, each of which induces a specific alteration in mammalian cells. These substances are: erythrogenic toxin, streptolysin O, streptolysin S, streptokinase, protease, ribonuclease, desoxyribonuclease, and hyaluronidase.

In about a third of the patients, the Group A streptococcus that has induced the nasopharyngitis precursor to rheumatic fever has disappeared from the upper respiratory tract before the onset of polyarthritis. An evidence of this fact lies in the existence, in the patients' sera, of antibodies against the extracellular antigens. The chief antibodies so far studied have been: antistreptolysin O, antistreptokinase, and more recently, antihyaluronidase.

No other upper respiratory infection, either bacterial or viral, has been shown to have the precursory significance with respect to rheumatic fever that has been demonstrated for those caused by Group A streptococci. Therefore, it seems logical to assume that this specific group of streptococcus comprises the chief infectious factor in causing this disease.

b) *Tissue-fixation of Antibodies in Rheumatoid Arthritis*—

Up to the present time, involvement of the supporting structures has been irreversible in Rheumatoid Arthritis. Pathologically there is an overgrowth of connective tissue. The pannus, seen in the rheumatic joint, consists of fairly undifferentiated connective tissue. There is an increased amount of depolymerized hyaluronate in the joint fluid of active rheumatoid arthritis, which may be correlated with the growth of poorly differentiated connective tissue seen in the pannus.

Changes in the rheumatoid nodule are similar to those seen in the nodule of rheumatic fever, and the central necrotic material of the nodule has certain staining characteristics of an acid polysaccharide or hyaluronic acid, but salicylates have only a minimal effect in rheumatoid activity, and the relationship between Group A hemolytic strep and rheumatoid arthritis has not been shown.

Recent observations of Wallis and Horvath, however, on the tissue-fixation of antibodies may provide a missing link in the pathogenesis of Rheumatoid Arthritis.

It is generally agreed upon that circulating antibodies are capable of becoming attached temporarily to tissue cells. An important site in this fixation is believed to be the walls of blood vessels, especially arterioles. The amounts of tissue-fixed and circulating antibodies, while they are not necessarily equal, are known to rise and fall together in a so-called "dynamic equilibrium." The purpose of this tissue-fixation of antibodies is presumably one of temporary storage.

This same mechanism, however, has unfortunate and sometimes drastic side-effects, of which the best known are the sensitivity reactions classified under the heading of

anaphylaxis. These reactions are believed to represent tissue response to the union of tissue-fixed antibody and homologous circulating antigen.

Dietrich and Nordmann in 1928, described the influence of intensive immunization on the vascular response to epinephrin in rabbits. They saw that the contraction of arterioles caused by administration of epinephrin was both weaker and briefer in over-immunized rabbits than in non-immunized rabbits.

Wallis and Horwath in 1939, noted that there were comparable alterations of the vascular response in humans. Measuring the rise of systolic blood pressure under epinephrin, they found that the vasoconstrictor response is apt to be impaired in the presence of excessive numbers of circulating antibodies and therefore excessive numbers of tissue-fixed antibodies *in large numbers* are able to impede the contraction of the arteriolar constrictor muscles. This effect is independent of the serological specificity of the antibodies.

Among subjects with impaired blood pressure response to epinephrin were patients with active severe typical rheumatoid arthritis. These patients have been shown to possess electrophoretic evidence of excessive numbers of circulating antibodies. Therefore, the tissue-fixation of antibodies in R.A. interferes, presumably, with the contraction of arteriolar smooth muscle, and becomes a central factor of major importance in the disease.

Naide and others in 1945, had interpreted *ready constriction and reluctant dilatation* as indicative of a high vascular tone, and found that all rheumatoid arthritics examined belonged to this group, and felt that the high vascular tone antedated the disease and was one of the predisposing factors.

We see then that the background factors favoring the development of Rheumatoid Arthritis, also favor the constriction of superficial peripheral arterioles. But—it has been noted that the tissue-fixation of antibodies could oppose the vasoconstrictor action through a "braking" action and cause them to tire readily. This offers a common ground for all the predisposing factors—viz: a capacity of decreasing the responsiveness of peripheral vasoconstrictor muscles either through over-stimulation or by offering resistance to their contraction.

It has been shown that synovial cells have a specific function in the synthesis of a lubricating material, identified by Meyer and others in 1939, as the mucopolysaccharide hyaluronic acid. It is assumed that in rheumatoid arthritis a "metabolite" of vasoconstrictor fatigue is liberated into the lumen of the arterioles and being transported, happens to find in the cells actively engaged in the synthesis of hyaluronic acid, biochemical circumstances that are receptive to its action.

The gap between vasoconstrictor "fatigue" on the one hand, and metabolic derangements in a synovial cell on the other, is apparently a difficult one to bridge under the present state of biochemical knowledge. This perversion in the synthesis of hyaluronic acid is presumed to occur intermittently and in a relatively few cells at any one time, and there is assumed to be a release of two abnormal substances:

1) An *antigen,* responsible for the patient's antibodies, derived from a perverted precursor stage of hyaluronic acid.

2) An *irritant,* responsible for the patient's local signs and symptoms, which is a breakdown product of the deranged synovial cells' own protoplasm. This irritant is a globulin, and Bauer and others have shown that globulin molecules deposited interstitially are removed only by lymphatics and since the local lymphatics are occluded in Rheumatoid Arthritis it is not surprising that the local symptoms are of long duration.

Therefore, to summarize, the pathogenesis of this disease in the light of recent observations suggests that:

1) Tissue-fixed antibodies oppose the contraction of arteriolar vasoconstrictor muscles by a "brake-like" action.

2) The agencies which favor the development of Rheumatoid Arthritis also have a tendency, with the help of high vascular tone, to tire peripheral vasoconstrictor muscles either through over-stimulation or by offering resistance to their action.

3) The theory is advanced that a "Metabolite" of the resultant smooth muscle fatigue interferes with the synthesis of the mucopolysaccharide hyaluronic acid by the synovial cells, producing two abnormal substances:

   a) An irritant responsible for the patient's symptoms.

   b) An antigen, which by arousing antibodies, complete a vicious circle, whereby the disease process perpetuates itself.

C. Clinical Manifestations

1) Joint Manifestations—most obvious manifestation, and serves as a point of departure in determining which category we are to classify the disease.

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2) Cardiac Involvement—

a) In rheumatic fever the carditis is a well recognized entity and no elaboration is necessary on the subject.

b) In Rheumatoid Arthritis—

Graaf, Hickey and Altmann at the Goldwater Memorial Hospital, Welfare Island, reviewed the protocols and microscopic sections of the heart for cardiac lesions in 66 cases of Rheumatoid Arthritis, studied at necropsy between 1939 and 1948. The mean age of both male and female was in the 7th decade.

Antecedent rheumatic fever was reported in the history of only one patient.

Gross valvular deformities were observed in twenty-nine cases; of these, nineteen were regarded as of the rheumatic type, but mild. In only one was there mitral stenosis. Pericarditis consisting of old adhesive or obliterative lesions were found in one-half the cases. In four, clinically unsuspected acute fibrinous pericarditis was found. Myocardial lesions included seven cases with active, chronic inflammatory interstitial myocarditis. Among these there were five of the granulomatous type resembling Aschoff nodules. In two cases, lesions like those of periarteritis nodosa were found in the coronary arteries, although periarteritis nodosa was not suspected ante-mortem.

On the basis of these results there were twenty-six cases with definite rheumatic types of cardiac lesions and nine others that were probably rheumatic, but the evidence was not conclusive.

These data indicate that careful study of the heart in Rheumatoid Arthritis is warranted even in the absence of overt clinical or gross pathological deformities. The evidence of cardiac involvement resembles that seen in rheumatic fever, but less diffuse or severe as a rule.

3) Changes in Protein Metabolism—

A great deal of work has been done on the abnormal serum protein patterns in the rheumatic diseases, and outstanding among the investigators have been:

Wallis, at the Pennsylvania Hospital, in Philadelphia;

Salt, at the Royal Infirmary, in Worcester, England;

Olhagen, in Stockholm.

The conclusions of all these investigators coincide as regards the changes in the serum proteins in Rheumatoid Arthritis and in rheumatic fever. They have found that the changes lead characteristically to: a decrease in albumin, and an increase in the globulin fraction. There is also an increase in the plasma fibrinogen.

This hyperglobulinemia they attribute to the combined effects of inflammation, tissue destruction, and immunization.

The sed. rate was interpreted in terms of plasma proteins through electrophoretic and other investigations, and the conclusion was that, in chronic diseases like rheumatoid arthritis and rheumatic fever, the rapid sed. rate results chiefly from an increase in the plasma fibroginogen and a decrease in albumin. The thymol turbidity test was found positive in patients with rheumatoid arthritis, and this is apparently due to an increase in serum gamma-globulin and a decrease in albumin.

Maclagan and others (1946) found that the serum colloidal gold test was much more sensitive than the thymol turbidity test in rheumatic diseases. The cephalin-cholesterol flocculation test was found to be of little value in these diseases.

Olhagen, in Stockholm, studied about 180 cases of arthritis and allied conditions in respect to their plasma proteins and found:

In rheumatic fever especially the alpha-globulin and fibrinogen were increased, but in cases with cardiac involvement with reaction on the part of the serous membranes, there is also a gamma-globulin increase.

The cases of rheumatoid arthritis in active stages are usually characterized by a gamma-globulin and fibroginogen increase. There is also a relative or absolute hypoalbuminemia as in rheumatic fever.

In febrile exacerbations the alpha-globulin increases, whereas in the more advanced stages of rheumatoid arthritis one finds the highest gamma-globulin values, frequently in combination with a rather low alpha-globulin content.

This work has greatly increased the possibilities of differentiating the blood protein changes in acute and chronic forms of rheumatism and is a valuable aid in the diagnostic and prognostic evaluation of the arthritic patient.

SUMMARY

(1) Rheumatoid Arthritis and various other dissimilar diseases are now being placed into the category of "collagen degeneration diseases" or diseases

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GROUPING AND TYPING OF THE STREPTOCOCCI WITH SPECIFIC BACTERIAL VIRUSES*

JOHN MORGAN MCKENNA

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The Charles V. Chapin fellowship for research in contagious diseases was established by the late Mrs. Charles V. Chapin in 1947. This fellowship is another outstanding contribution to the memory of her famous husband whose lifetime in public health work won for him world-wide recognition.

It seemed indeed fitting that the fellowship should be established in the hospital which bears Doctor Chapin's name and owes so much to his ideas and advice. We are sure the medical profession in Rhode Island is interested in the progress and in some of the scientific results obtained from this fellowship.

Mr. John Morgan McKenna, a graduate in Biology from Providence College and a former student in the graduate school of the University of Michigan, has presented the results of his work for one year's duration, 1951 to 1952. This work was conducted under the supervision of Mr. Edmund G. E. Anderson, Assistant Director of the Hospital Laboratory, and Reverend Nicholas Serror, O.P., Professor of Bacteriology at Providence College. Mr. McKenna is the third scientific investigator who has been assisted by the Dr. Chapin fellowship.

THE EDITORS

THE UNAVAILABILITY of streptococcal grouping and typing sera has presented a problem to hospitals desiring accurate epidemiological records of streptococcal diseases. This onus is being felt particularly by hospitals associated as an integral part of a municipal public health department. The primary source of streptococcal grouping and typing sera has been the biological and pharmaceutical houses. These avenues of biological sera have been closed during the past several years. The present source of specific streptococcal sera is the Research and Diagnostic Laboratories of the New York State Department of Health, but this output is restricted to the National Institute of Health Communicable Disease Center. This lack of diagnostic sera prompted The Charles V. Chapin Fellowship Committee to approve and support research in the field of bacterial viruses as a possible source of grouping and typing material.

A search of the literature revealed that work had been done in grouping and typing bacteria with bacterial viruses. Evans[7] pioneered the work with regard to the streptococci. It was due to her encouragement and assistance that an attempt to find a practical method for the identification of various strains of streptococci with bacterial viruses (bacteriophage) was undertaken by the laboratories of the Charles V. Chapin Hospital and Providence College.

Evans[6] prepared and described four serological groups of streptococcal bacteriophage which were designated A, B, C, and D, respectively, to conform with the references to bacteriophage specific for other genera of bacteria. In a later publication,[8] she described the techniques used in classifying the various strains of streptococci according to the Lancefield serological groupings.

It has been shown by Evans[9] that bacteriophage in the nascent state, i.e., in the presence of bacterial cells upon which the bacteriophage was grown is more potent than in the filtered state. Both the nascent and the filtered bacteriophages may be used for the differentiation of certain streptococcal groups for which one or another of the several types of bacteriophage have special affinities. In the Chapin studies, however, only the filtered bacteriophages were used.

Sources of Bacterial Viruses

In preparation for the actual grouping and typing experiments, a search was made for possible sources of bacteriophage. A number of sewage samples from the City of Providence Sewage Disposal Plant were taken at various times of the day and on various days of the week. Approximately 100 ml of each sample were filtered through Berkefeld N filters. The filtrates were then transferred to aliquot portions of five-hour broth cultures of the test organisms. The culture medium for all tests was Difco brain-heart infusion broth. All flasks were incubated at 22°C for 24 hours. Following this period of incubation all flasks exhibited heavy bacterial growth. The contents of the flasks were re-

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*From the Laboratory Section, The Charles V. Chapin Hospital, Providence, and the Biology Department, Providence College.

filtered and the procedures of the previous day repeated using the filtrates as the inciting media. All samples from the City Sewage Disposal Plant showed similar results. Efforts to obtain bacteriophages from this source were then abandoned.

The above procedures were carried out with twenty-five fecal specimens. After numerous trials, no bacteriophages were recovered from these sources.

A sample of sewage was taken at an optimum time from the Cranston, R. I., Sewage Disposal Plant which contained bacteriophage in such high titer that the sewage alone completely lysed the initial test culture. Bacteriophages from this source were used for all experiments in grouping and typing.

Preparation of Bacteriophages

The method of preparing bacteriophage in large quantities is based upon the observation that bacteriophage inoculated with bacterial organisms increased in lytic titer after prolonged incubation at room temperature.

A bacteriophage was prepared with Strain 751, one of the test cultures of hemolytic streptococci received from Miss Evans of the National Institute of Health, Bethesda, Md. A series of broth dilutions of bacteriophage ranging from 10^{-1} to 10^{-10} were made and inoculated with Strain 751. All series were incubated at 22°C for one week. As is often the case, resistant forms developed in some of the dilutions. The individual dilutions were filtered following the incubation period and tested for lytic titer. It was found that the filtrates of these dilutions had a higher titer than the original bacteriophage from which the dilutions were made. The lytic factor was even noted in the 10^{-10} dilution which had developed resistant forms. This observation confirmed an earlier report that, under certain conditions, prolonged incubation at room temperature enhances the lytic power of bacteriophage despite the presence of resistant forms.

Table 1
Titers of the Individual Phages

Phage	*Initial*	*Secondary*
A/751	10^{-6}	10^{-7}
B/563	10^{-6}	10^{-8}
C/594	10^{-5}	10^{-7}
D/693	10^{-6}	10^{-7}
3/9228	10^{-6}	10^{-8}
17/6557	10^{-7}	10^{-8}
19/9019	10^{-6}	10^{-7}

Bacterial Organisms

Seventy-four strains of beta hemolytic streptococci isolated from active cases of streptococcal infections were used in the grouping and typing experiments. Four strains of hemolytic streptococci used by Miss Evans in her study of bacteriophage were also used in this study. All of the strains were studied on the basis of purity of culture and constancy of physiological characteristics.

In the preparation of bacteriophages corresponding to the Griffith Types, the same system of designation used by Miss Evans was employed, e.g., 19/9019, 17/6557, and 3/9228. The first numeral, or numerals, indicates the race of bacteriophage; the second series of numbers designate the classification assigned to the specific beta hemolytic streptococci by the American Type Culture Collection. The Lancefield Group bacteriophages and their corresponding parasitized bacterial organisms have been designated according to the following example: A/751, B/563, D/693.

Grouping and Typing with Specific Bacteriophages

With the successful isolation of bacteriophages of high titer from the sewage of Cranston, serial tests were set up to determine the practicability of bacteriophage as grouping and typing agents. All collected strains of beta hemolytic streptococci were subjected to group and type classification according to a uniform technique.

In order to determine the sensitivity of a given strain of streptococci to the phages in question, the following technique was used. A 2m/m loopful of the strain to be tested was seeded into 5 ml. of broth in each of two tubes, and incubated at 37°C for five hours. Following incubation, 0.5 ml of the phages specific for the Lancefield Groups A and C was placed in each tube respectively. The cultures were incubated at room temperature overnight and the tube remaining clear was taken to be the group to which that particular strain belonged. The same technique was used in determining the Griffith type of the organisms with those strains which were found to belong to the Lancefield Group A.

It was found upon repeated experimentation that the optimum lytic power of specific bacteriophages occurred when the tubes were incubated at room temperature (20°C-25°C). A temperature of 30°C even for a ten or eleven hour period showed inconclusive results. In no case could definite results be obtained at temperatures higher than 30°C.

Results were obtained with 75% of the organisms examined following incubation at 27°C for 18 hours. Some bacteriophages, such as those used for the enteric group of bacteria, function well at 37°C, but the streptococcal bacteriophages are inactive at this temperature.

Table 2

Groups	*Types*	
Group A	19	10
	17	16
60	3	17
	Unknown	13

Group C	
10	Not Typed
Group D	
4	Not Typed

Final grouping and typing of experimental strains.

Note: One strain was lysed by all races of bacteriophages.

Two strains were lysed by both 17/6557 and 3/9228.

One strain was lysed by 17/6557 and 19/9019.

Storage of Bacterial Viruses

Storage of bacteriophage is best accomplished in airtight containers. For this purpose plasma bottles of 500 ml. capacity were used. The final filtration of each bacteriophage may be made directly into the storage bottle. This was accomplished by wiring a canula of sufficiently large bore directly to the filter apparatus. Twenty or twenty-one gauge needles of any length serve the purpose very well. The storage bottles may be sterilized with the self-sealing rubber stopper in place if a small needle (25 gauge) is inserted through the stopper to permit the escape of air. The bacteriophage may be removed with a sterile syringe. Air may be allowed into the bottle from time to time in order to equalize the pressure built up by repeated withdrawals of bacteriophage. This may be accomplished by inserting a sterile needle, attached to a sterile air filter, into the stopper. Contamination of the bacteriophages has not occurred in the routine use of this method.

Summary

1. Group and type specific sera for the streptococci are no longer available.

2. Previous work with bacterial viruses as diagnostic agents in the classification of the streptococci suggested that bacteriophages could be used to advantage in the preservation of the epidemiology of streptococcal diseases.

3. A prolific source of bacteriophage was found in the sewage of Cranston, Rhode Island.

4. Simple, routine techniques have been used in increasing bacteriophage lytic titer.

5. Attempts to group seventy-four strains of beta hemolytic streptococci with specific bacteriophage were effective in all instances. In this enumeration, sixty of the strains have been classified as falling in Group A, ten in Group C, and four in Group D.

6. Typing was effective in fifty-six of the sixty possible types studied from Group A. It was determined that ten of the organisms were Type 19; sixteen, Type 17; seventeen, Type 3. Thirteen of the remaining organisms were placed in undetermined type classifications.

7. A practical method of storing Group and Type specific bacteriophages is described.

Conclusion

The ease in which bacteriophages may be recovered from raw sewage and the consistent results obtained in Grouping and Typing of beta hemolytic streptococci with specific races of bacteriophage recommends this procedure as a routine program in hospital laboratories.

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SPONTANEOUS RUPTURE OF THE ABDOMINAL AORTA*

SEEBERT J. GOLDOWSKY, M.D.

The Author. *Seebert J. Goldowsky, M.D., of Providence, R. I. Assistant Surgeon, Department of Surgery, Rhode Island Hospital.*

THE PURPOSE of this report is to attract attention to the increasing incidence of ruptured abdominal aortic aneurysm and to emphasize the clinical features of this syndrome.

The present study is based upon 15 cases of spontaneous aortic perforation verified by postmortem examination from the files of the Rhode Island Hospital Institute of Pathology. The 15 cases reported herein occurred between 1936 and 1950. There were 10 males and 5 females. All of the patients were white. They ranged in age from 55 to 82, the average age being 68.

The commonest single finding was pain of varying severity. It was present in 14 of the 15 cases, but was somewhat equivocal in another. The pain varied greatly in severity and in location. In one instance it occurred within the chest with radiation to the shoulder.

The next most common finding was an elevated polymorphonuclear leukocyte count. It was elevated in 9 of 10 cases in which a white count was recorded, varying from 9,300 to 40,400. In 5 instances it reached levels of over 20,000.

Other positive findings were less constant. Vomiting and an abdominal mass were each present 7 times. Distention and abdominal tenderness were present 5 times each. Spasm was noted only twice. While shock supervened eventually in all cases, it was present initially on only 7 occasions. Anuria was an important finding in 3 patients. A lower nephron nephrosis was found on pathological examination on one occasion. One patient presented an elevated serum amylase. There was usually no great elevation in the temperature. It rose above 100 in only 2 instances and never exceeded 101. X-rays of the abdominal region were available in 11 instances but in only two was aneurysm suggested as a possibility. In no instance was erosion of the vertebrae described.

This study has emphasized the fact that rupture of the abdominal aorta is not a cause of sudden death. Following the onset of symptoms patients survived from 5 hours to 27 days. In 12 instances survival exceeded 24 hours, while in 8 instances it was 5 days or longer. (Table I).

Table I — Clinical Findings in 15 Cases

	No. Cases
Pain	14
Elevated white count	9
Initial shock	7
Vomiting	7
Abdominal mass	7
Tenderness	5
Distention	5
Anuria	3
Elevated temperature	2
Positive x-ray findings	2
Elevated amylase	1

Pathological features of the disease were of some interest. Arteriosclerosis was a marked factor in each case. In 8 instances the aneurysm was saccular in type while in each of 2 instances it was fusiform on dissecting. In 3 instances the notations were not sufficiently clear to indicate whether the lesion was saccular or fusiform. If all of these latter were considered to be fusiform, the preponderant group would still be saccular. Multiple aneurysms were found twice. In one of the instances of dissecting aneurysm, medial cystic necrosis was described. In 1 case the aneurysm ruptured into the duodenum. In 10 instances the aneurysm was definitely noted to be below the renal arteries while in 3 it was at or above this level (Table II).

Table II — Pathological Findings in 15 Cases

	No. Cases
Aortic arteriosclerosis	15
Saccular aneurysm	8
Fusiform aneurysm	2
Dissecting aneurysm	2
Saccular or fusiform, indefinite	3
Multiple aneurysms	2
Rupture into duodenum	1
Medial cystic necrosis	1
Below renal arteries	10

*From the Peripheral Vascular Clinic and the Surgical Service, Rhode Island Hospital, Providence, R. I.

Two of the cases were reported through the courtesy of the Pawtucket Memorial Hospital. The author wishes to express his appreciation to several members of the staff of the Rhode Island Hospital for permission to use private cases.

The following case report is fairly typical of others in the series:

CASE REPORT. This 55-year-old female was admitted to the Rhode Island Hospital on April 1, 1949 with a story of having been well and active until two weeks before. Since that time she had been in bed with a head cold and cough. Three days before admission to the hospital she developed pain in her right flank. The pain appeared during the night, was moderately severe and did not radiate. Her systolic blood pressure as recorded by her doctor at that time was 170. For the two or three days preceding admission she had had no appetite although there was no nausea or vomiting. Her bowels which previously had been regular, were constipated. Several hours before admission the patient complained of very severe pain over the entire abdomen, suggesting gas pains. Shortly after this she became unresponsive, but she rallied shortly and complained of dyspnea. The stupor reappeared and she was sent to the hospital.

Physical examination revealed an acutely ill obese female complaining of dyspnea and abdominal gas pains. She was very pale and her skin was cool and moist. Blood pressure 75/50. Temperature 101 per rectum. Pulse 124. Respirations 26. Her pupils were widely dilated. Her tongue was dry and smooth. Her heart and lungs were not remarkable, although later bilateral crepitant basal rales and ronchi were found. Her abdomen was obese and in the right upper quadrant a mass consistent with liver edge could be felt a few centimeters below the costal margin. There was no tenderness or spasm, but a few hours later definite distention was noted. The femoral pulse could not be detected on the left side. Rectal examination gave negative results.

White blood count on admission was 40,400. Red blood count was 2,950,000 and hemoglobin 9.0 grams. Blood smear showed 75 percent mature neutrophiles, 13 young forms, one neutrophilic metamyelocyte, one neutrophilic myelocyte, 9 lymphocytes and one monocyte. There was a slight anisocytosis and polychromasia. Catheterization yielded no urine at this time, but several later specimens were not remarkable except for occasional red or white cells and small traces of albumin. Sedimentation rate was as follows: 15 minutes, 53; 30 minutes, 56; 60 minutes, 60. Blood glucose 277. Blood urea nitrogen 18. Serum amylase 29. Stool guaiac negative. A subsequent blood sugar was 100. The white blood count later declined to 19,850 and then to 13,650 with 79 percent polymorphnuclear leukocytes. At the same time, however, the red count fell to 2,860,000 and 2,650,000 and the hemoglobin to 7.8 and 7.6 grams. The red cells continued to show polychromasia and achromia. Other blood studies in the meantime were completed. Coagulation time was 43 minutes in silicone and eight minutes in glass. Bleeding time three minutes. Goethlein index 15 petechiae per area. Platelets 120,000. Clot retraction time high normal. Mean corpuscular volume 87. Mean corpuscular hemoglobin concentration 33. Mean corpuscular hemoglobin 28. Hinton negative. Repeat stool examination was guaiac negative. Gastric analysis yielded no free acid in the fasting specimen, but histamine produced free hydrochloric acid. Sputum smear and culture showed neisseria predominantly and a few staphylococcus albus.

Chest x-ray examination was non-contributory. There was no free subdiaphragmatic gas. Abdominal x-ray failed to visualize the right renal shadow, but was otherwise unremarkable. A repeat chest plate on April 5 revealed no significant changes. Electrocardiograms on the day of admission and on April 5 showed no evidence of an acute myocardial process.

The patient was given 1,000 cubic centimeters of plasma, intravenous fluids, penicillin and sedatives. Her general condition gradually improved, her blood pressure eventually reaching 180/80. Her pulse varied between 80 and 120 and her temperature between 99 and 101.8. Her lung signs remained about the same. The abdominal distention persisted, although patient had several loose bowel movements. She took some nourishment and fluids by mouth.

On April 7, her seventh hospital day, following a drink of water she complained of cramp-like abdominal pain. Her color became poor, her lips cyanotic and she perspired freely. Her pulse became weak and thready, her blood pressure dropped to 40/0 and she expired within 30 minutes.

Postmortem examination revealed a saccular arteriosclerotic aneurysm of the aorta 3.0 centimeters below the renal orifices. The aneurysm which measured 7x4 centimeters had ruptured on its right lateral aspect producing a retroperitoneal hematoma involving the tissues surrounding the upper portion of the ascending colon, right kidney, duodenum, right adrenal and the attached mesentery. (Plate I.)

Comment

Reports relating to the problem of abdominal aortic aneurysm have appeared in the literature for many years. One of the most extensive was that of Nixon in 1911[1] analyzing 233 cases of abdominal aneurysm, 223 of which involved the aorta. Spontaneous rupture occurred in 152 of these. Most of the cases fell in the age group 25 to 45. The majority were syphilitic in origin. In contrast to this the youngest patient in our series was 55 years of age and syphilis did not occur. The present 15 cases have been selected from a total of 5,210 autop-

continued on next page

sies. This is an overall incidence of 1 in 347. During the period 1944 to 1950 the incidence was actually 1 in 228 and twice during this period there were as many as 3 in one year. This would scarcely be called a rare condition.

Our material emphasizes the high incidence of pain and an elevated white count. There was a preponderance of males in the ratio of 2 to 1. There is little to distinguish this serious abdominal catastrophe from others, such as mesenteric thrombosis or acute pancreatitis. One must conclude that the diagnosis of aortic rupture is a possibility in any elderly patient presenting symptoms of acute severe abdominal disease.

The absence of sudden death is a feature that should be stressed. As previously noted, 12 of the 15 patients survived 24 hours or longer. This encourages the hope that some of these patients may be salvaged by surgical measures. The high proportion of saccular aneurysms and of those occurring below the level of the renal arteries makes this an attractive possibility. The number of successes, however, has thus far been very few as might be expected from the friable nature of the vessels involved. Wiring and electrical coagulation described originally by Moore in 1864 and Corradi in 1879[2, 3] have again been popularized by Blakemore.[4, 5] Linton[6] advocates wiring without the addition of other measures. Blakemore has been able to salvage patients in whom perforation has already commenced. Recently[7] he has combined his procedure with proximal constrictive occlusion. The apparatus required for electrothermic coagulation is complex and is not generally available, but the procedure is not a wholly essential adjunct. Other methods of treatment currently available are reinforcement with polythene,[8] tantulum mesh,[9] cutis grafts[10] and fascia lata.[11] Aortic grafts[12] have also been suggested. When rupture has already commenced these latter devices may not seem too helpful. With current research activity in vascular surgery, however, and the availability of adequate amounts of blood for replacement, the problem does not seem beyond solution. The increasing incidence of this striking clinical entity makes it essential in any case that consideration always be given to it in the differential diagnosis of the acute abdomen of the elderly.

Conclusions

1. Rupture of the abdominal aorta as a result of aneurysm is apparently increasing in incidence.

2. The diagnosis must be considered in any elderly patient presenting an acute severe abdominal disease.

3. Abdominal pain is the only constant finding. A pulsating mass and x-ray findings of aortic pathology will usually suggest the diagnosis, but do not occur constantly enough to be reliable.

4. Death is not sudden. There may be an interval of several hours or days during which surgical therapy may be instituted.

5. Recent advances in resuscitation and in vascular surgery bring this hitherto disastrous disease closer to the realm of successful treatment.

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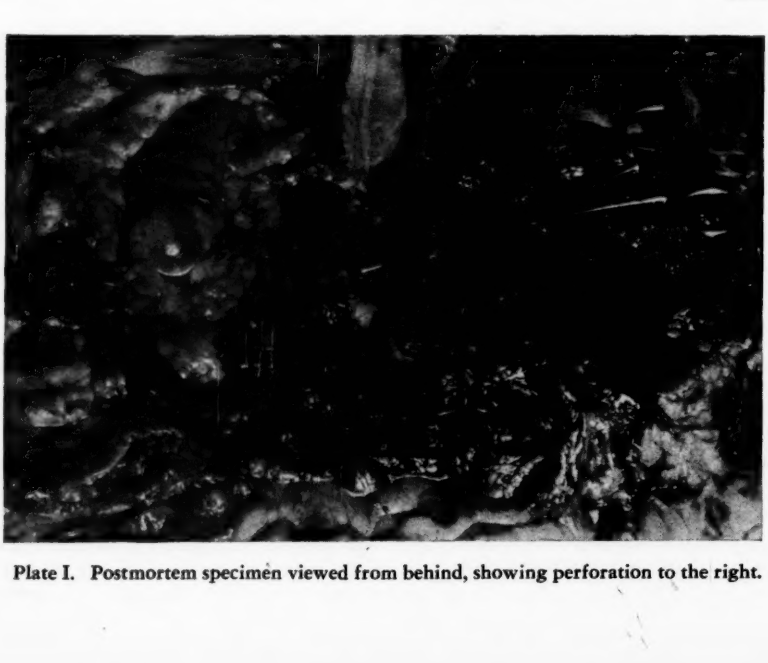

Plate I. Postmortem specimen viewed from behind, showing perforation to the right.

The RHODE ISLAND MEDICAL JOURNAL

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CARELESS PUBLICITY

THE MEDICAL EDUCATION of the public is important, and it would seem almost a truism that the medical profession should lead in this. It is extremely doubtful if they do, however. Most of the commercial organizations are tremendous in size. They consider it axiomatic that publicity is one of their most important agents. These commercial organizations are of two types, and they are pretty sharply divided as to their nature.

On the one side are the big purveyors to the medical profession whose advertisements we run in our journals and who we are convinced are high in all their standards. On the other hand are a number of businesses who peddle their goods over the counter and who advertise directly to the public mostly, apparently, by means of the radio and television.

Many of us feel that acidosis is not a great national problem. Most of the general public hear many times a day authoritative statements that it is, and that they are in danger of disaster if they do not heed it. What enormous amounts of bicarbonate of soda and similar drugs are swallowed daily at least doing no good and frequently doing great harm.

Consider what Stanley Cobb refers to as "cruel advertising of halitosis" causing inferiority complexes in many unfortunate people. Is there any doubt in most of your minds that cigarette smoking is overdone because of the tremendous pressure of advertising in back of it?

Business seems to believe that there is little restriction on high pressure advertising as long as it does not actually make false statements. But of course the public nowadays is getting lots of teaching from what are undoubtedly altruistically minded sources. The cancer campaign is a worthy one. It is high time that the public should be more on its guard against cancer than it has been in the past. But even the doing of good can be overdone. Every doctor knows that a tremendous "cancerphobia" has been aroused in the populace. It is indeed a difficult problem as to how the people should be warned without being terrorized.

Consider the polio campaign; quantitatively the paralysis and death from polio are certainly not big as compared with rheumatic heart disease, arthritis, and the automobile accidents. What a tremendous hysteria has been aroused in the populace out of proportion to the size of the problem. A pediatrician reported a day or so ago that he had left his office and made three calls. Each child had a little fever and a little malaise, but nothing suggesting in any way, poliomyelitis. Yet each mother was evidently in a panic of fear.

Fear of cancer which has been aroused in late years has undoubtedly led to the early treatment which is so necessary, and therefore it was all to

continued on next page

the good in those cases. Has the fear of poliomyelitis accomplished much by leading to early treatment or even prophylaxis?

The popular medical writings which there are so many of in our newspapers and magazines undoubtedly leave much to be desired. There is usually incredibly cheerful news about new drugs and treatments which often do harm by arousing sadly false hopes. When they don't do this they then strive hard to scare the people. Only the other day we saw a pessimistic newspaper article on the dangers of high blood pressure, which went so far as to say that a systolic blood pressure of 130 was abnormal.

Some of the reports which do not altogether satisfy us come from pretty high sources. Within a week there is a newspaper story of a child hit by an automobilist who was found to be under the influence of barbiturates. There is much evidence now that the abuse of barbiturates is widespread. A few weeks ago, the "Journal of the American Medical Association" gave out a news release in which they told the public that sweaty feet, which they dignified with the name of "hyperhidroses", could be treated, and the patient made comfortable, by taking a barbiturate in six-grain doses. Later when we received our "Journal", we learned that this paper was founded on two cases, both of the patients having been badly psychotic individuals. That impressed us as careless publicity.

FOR BETTER UNDERSTANDING

The current vogue is to lump many problems under one filing of "public relations," and to write off misunderstandings as poor public relations. Pursuing such a premise we infer that when we are understood our public relations are good.

That being the case our committee on public policy and relations has approached the problem realistically with its informative news bulletin, its conference for the personnel of the doctor's office, and with its announced plan for a press conference at which news writers of the State may joust verbally with some of our physicians.

The conference for the personnel of the doctor's office provided an opportunity for our employees who for the most part are first to greet our patients, new and old, to observe how their work may reflect upon both their physician-employer as well as the entire medical profession. Experts from governmental agencies provided informative advice on ways to assist the doctor in the filling out of those troublesome and multitudinous claim forms that plague our waking hours. Members of our own Society set forth some sound suggestions as to ways in which our patients may be received in our offices—and over the telephone—to our advantage and theirs.

The planned conference at which editors will have the opportunity to present their views regarding doctors, who in turn will diagnose the journalistic ailments of the news and editorial writers, appears a reasonable solution to a vexing problem that is undoubtedly rooted deep in mutual misunderstandings.

A NEW PRESIDENT

By the time this comment appears in print the country will have a new leader elected as President of these United States. But our thoughts at this writing are about another president—our energetic colleague from Pawtucket—Dr. Charlie Farrell.

At the annual meeting of the Association of American Physicians and Surgeons, held in Denver early in October, Doctor Farrell was elected as president of that organization, succeeding Dr. Denton Kerr of Houston, Texas. The transfer of the leadership of this national organization from the largest to the smallest state proves anew that it is not where you come from that counts as much as what you can do. And Charlie Farrell has a flair for doing many things—and doing them exceptionally well. It is no surprise to us, therefore, that he has been signalled out for the leadership of the outstanding association of physicians concerned with the socio-economic aspects of medical practice.

The activities of the Association of American Physicians and Surgeons has won far greater support in the areas west of the Alleghenies than elsewhere. It is significant that Doctor Farrell is the first Easterner to be elected president of the Association which Willis E. Stone, president of the American Progress Foundation, characterized as "a unique group of extraordinary individuals united in the cause of human freedom, . . . (who) believe in learning about freedom, what can be done to preserve it, and then leading the way for those who honestly seek freedom."

The editors of the *Journal* join with the House of Delegates and the members of the Society in wishing President Charlie Farrell a most successful tenure of office.

216 POSITIVES

Under the sponsorship of the diabetes committee of the state medical society a total of 11,347 tests were made during the 1951 diabetes detection campaign, which resulted in the reporting of 216 positives of whom 42 were juveniles.

This result is ample evidence of the importance of this public health program that has developed in the past three years as the result of the enthusiastic work of Dr. Kramer and his active committee. Last year the committee broadened its pro-

gram and called upon several community agencies to lend support to the publicity work incidental to diabetes detection week. The result of this increased activity is reflected in the larger number of voluntary examinations made.

Again the search for diabetes in our communities will be highlighted this month with the annual detection campaign scheduled for the week of November 16-22. A statewide organization is now in the process of operation as the result of recent meetings at which representatives of the nursing and pharmaceutical professions, health and welfare agencies, industry and labor took part in planning campaigns at local levels.

Again the medical profession has demonstrated a leadership in furthering a positive health education and disease control program for the benefit of every citizen. The reward is only the satisfaction of a difficult job well done in the preservation of health.

CANCER DETECTION

Peter Pineo Chase, M.D.
Editor-in-Chief
The Rhode Island Medical Journal
106 Francis Street
Providence, Rhode Island

Dear Doctor Chase:

I should like to venture a few comments on the letter to the editor entitled: "Cancer: Early Detection as Related to the Total Health Program", published in the journal of March, 1952. If my interpretation is correct, a plea is made for orientation of the cancer detection program to the office of the private physician rather than to the formally organized facility, i.e. the Cancer Detection Center. The letter states: "The new orientation suggested would attract the warm cooperation of all members of the profession." I do not know the basis on which this prediction is offered. I suspect it is a pious hope. Actually there is evidence that the cooperation of members of the profession in such programs is less than warm. In one State not far from Rhode Island, having approximately 6500 licensed physicians, the number of doctors agreeing to perform health maintenance or cancer detection examinations, was one-third of the entire group of practicing physicians. In another, of over 14,000 physicians, only 1,666 agreed to cooperate in the detection program focused in the doctor's office. It could be that what the high-minded writers of the letter consider desirable and what is practical are not the same. The letter contains also a statement attributed to B. F. Boyd, Jr., which reads: "The facts remain that in the presence of neoplatic disease physician-patients present themselves for treatment later and that their cancers have a comparably poorer chance of cure than those of the general population." That these conclusions are drawn from a study of 60 physician patients may account for their remarkable divergence from the facts: The cancer death rate among physicians is about four-fifths of that among white men as a whole, and the rate for surgeons is about four-fifths that of physicians in general of comparable ages—or 66% of the general white male rate.

While a strong case can be made for cancer detection of general periodic physical examinations in the doctor's office for those who can pay, what is to be done about the numerous class who depend upon out-patient and ward hospital service for their medical care? Should there not be a clinic-oriented detection program for this group in order to provide the services available in private offices at the usual office rate?

Sincerely yours,

CHARLES S. CAMERON, M.D.
Medical and Scientific Director,
American Cancer Society, Inc.

THE WORLD MEDICAL ASSOCIATION

WHEREAS, The World Medical Association, organized in 1947, is now composed of the national medical associations of forty-three countries, and

WHEREAS, the stated objective of this Association is to assist all people of the world to attain the highest possible level of health through promotion of closer ties among medical associations and physicians, through exchange of information of interest to the medical profession, through maintenance and protection of the honor and interest of the profession, through efforts to raise the standards of medical education, care and health, through study and reporting of professional problems, and through presentations of the world medical opinion to the World Health Organization and the United Nations,

THEREFORE, Be It Resolved, that the House of Delegates of the Rhode Island Medical Society, in meeting at Providence, Rhode Island, on October 1, 1952, endorses the work of the World Medical Association and urges the physicians of this State to identify themselves with the Association by becoming members of the United States Committee of the World Medical Association.

. . . Adopted by the House of Delegates of the Rhode Island Medical Society, October 1, 1952

RESPONSE OF PATIENTS WITH RHEUMATOID ARTHRITIS TO THE ADMINISTRATION OF NITROGEN MUSTARD*

ARTHUR M. PHILLIPS, M.D., ROSWELL W. PHILLIPS, M.D., AND WENDELL T. CARAWAY, PH.D.

The Authors. *Arthur M. Phillips, M.D. and Roswell W. Phillips, M.D., Physicians, Department of Medicine, U. S. Veterans Administration Hospital, Providence, R. I. Wendell T. Caraway, Ph.D., Biochemist, R. I. Hospital, Providence.*

THE OBSERVATIONS which we are presenting are limited and in part incomplete. They are offered chiefly in the way of a report of a clinical study into the basic mechanism of one of the collagen diseases; namely, rheumatoid arthritis. We shall present data which we consider to be evidence in support of a particular concept of the pathogenesis of the disease.

It has been suggested[1a-e] that rheumatoid arthritis as well as others of the collagen diseases are the result of a continuous hypersensitivity reaction in which antigen fixed in the mesenchymal tissues reacts with circulating antibody. The allergic hypothesis of the rheumatic process is based chiefly on certain characteristics of the disease that suggest allergy. These are, the clinical similarity to serum sickness, morphologic analogy between rheumatic lesions and those caused by necrotizing allergic reactions in experimental animals[1a, 2a-e] and an increase in the gamma globulin fraction of plasma proteins. The latter is a characteristic accompaniment of the rheumatic process.[3a-d] A close association of gamma globulin with the immune response has been well established.[4]

At this point a brief review of the serological sequence of events in the hypersensitivity reaction seems pertinent. Introduction of antigen is followed by its demonstration circulating in the serum. A period of time then ensues, commonly spoken of as the incubation period, during which the concentration of antigen decreases and the serum complement titer falls. This fall is maximal by the time the circulating antigen disappears from the blood stream. Circulating antibody then begins to appear. Data from experimental studies[5] indicate that lesions are due to reaction between antigen fixed on tissue cells and circulating antibody, perhaps united with complement.

*Presented at the 141st Annual Meeting of the Rhode Island Medical Society, at Providence, R. I., May 7, 1952.

If then, rheumatoid arthritis is truly pathogenetically related to a hypersensitivity reaction it is reasonable to assume that the series of events just described, with perhaps some slight modifications, should be taking place. Direction of investigation into the various components of this reaction may bring forth evidence either for or against such a hypothesis. Considerable study has already been done. The serum complement titer has been measured in rheumatoid arthritis and several of the other collagen diseases as well as glomerular nephritis. It has been found to be depressed in acute glomerular nephritis,[6] lupus erythematosus disseminatus,[7] serum sickness and certain experimental antigen antibody[9a-b] reactions both in vitro and in vivo. In rheumatoid arthritis[10] and rheumatic fever[11] however, it is strikingly elevated. This would suggest that we are not dealing with an immunological response in the case of rheumatic fever and rheumatoid arthritis were it not known also that certain antigen antibody reactions do not fix complement.[12] In addition, allergic reactions caused by simple chemical antigens and whose clinical manifestations are similar to serum sickness were found to have a high complement titer.[11] Because immunologic or allergic reactions may occur without apparent fixation or diminution in complement, the possibility remains that the rheumatic process may be allergic and yet fail to fix complement. Thus study of complement has neither refuted nor supported the allergic concept.

We may now direct our attention toward another component of the allergic response, the antigen. There is no agreement as to the nature of the antigen in rheumatoid arthritis. Identification has not taken place. Interest in the possible relation to the streptococcus has led to serological studies. In 1929 Cecil[13] reported that certain strains of group A streptococci were agglutinated in high titer by sera of patients with rheumatoid arthritis. Others have since confirmed this finding. However, further investigation of the reaction through the use of collodian particles,[14] non-encapsulated pneumococci[15a-b] and sheep cells[16a-b] sensitized by rabbit anti-sheep cell amboceptor has thrown considerable doubt on the specificity of the reaction. The present view is that the mechanism is unknown and may well be

non-specific. The anti-enzyme (anti-hyaluronidase, anti-streptokinase, anti-streptolysin O) titers so frequently increased in the presence of recent streptococcus infections[17] and elevated in patients with rheumatic fever[17] are not different in patients with rheumatoid arthritis than the titers found in the general population.[17] Failure to incriminate the streptococcus has led to search elsewhere. The view has been expressed that the antigen could be derived from the patients' tissues.[1d] Persistence of antigen in the affected areas has suggested to some that it might be a living agent of low pathogenicity. The pleuropneumonia organism[18] has been mentioned in that regard but direct evidence has not been presented. Others feel that the prolonged tissue reaction is due to non-specific auto-antibody production by the body which, once begun, continues in the absence of specific antigen. Rich[19] states that "in the case of lesions in which hypersensitivity constitutes the actual pathogenetic mechanism of injury the etiological agent may be quite different in different cases."

The remaining component of the hypersensitivity reaction is antibody. We have already noted that it is carried in the gamma globulin fraction of the plasma and that increase in this fraction is commonly present in active rheumatoid arthritis. Antibody response to recognized antigens, however, forms only a small part of the bulk of the gamma globulin.[25]

There is a further method of study available which lends itself to both experimental and clinical investigation. One may prevent the lesions resulting from hypersensitivity responses by interrupting the chain reaction at one of its links.

1. Prevention of production or elimination of antigen.
2. Inhibition of antibody formation.
3. Prevention of tissue response to the interaction of antigen and antibody.

In view of the lack of identification of the antigen in rheumatoid arthritis therapy directed against this factor in the reaction cannot be carried out with specificity.

Diminution of tissue response to the antigen antibody reaction can be accomplished by the use of ACTH or Cortisone.[20] These hormones have been strikingly effective in reducing the inflammatory response in rheumatoid arthritis but commonly an equally striking relapse follows their withdrawal. In diseases where the antigen antibody reaction is self limited, such as drug sensitivity or serum sickness, these hormones seemingly effect a cure. However, in rheumatoid arthritis persistence of the disease mechanism causes the clinical relapse as the protective action of the steroid is withdrawn.

It is not known with certainty which cells of the body function to produce antibodies but those belonging to the so-called reticulo-endothelial system are felt to probably be responsible.[21a-b] Inhibition of antibody production in the experimental animal can be accomplished by a number of methods. Saturation of the reticulo-endothelial system with particulate agents,[22] total body irradiation and the use of nitrogen mustards have been mentioned.[9a] These agents have in common a toxic action of the reticulo-endothelial system and presumably exert their antibody inhibiting action in that manner. There is yet no agreement on whether ACTH or Cortisone directly influence antibody production.

In the following study we have attempted to influence antibody production in cases of rheumatoid arthritis by the administration of nitrogen mustard. All patients had been observed for a considerable period of time, usually several months, before treatment in order that a satisfactory clinical evaluation of change in the disease process could be carried out. We have used the gamma globulin in following the level of antibody production. Gamma globulin was measured according to the method of Kibrick and Blonstein.[23] The degree of clinical activity was graded from 1+ to 4+. One plus activity was felt to be present when mild joint pain and stiffness was the only findings. High fever, marked joint pain, swelling and limitation of motion were considered to represent 4+ activity. Two and three plus activity were representatives of lesser degrees of fever, joint pain and swelling.

CASE I E.M.: This 46-year-old male developed polyarthritis eight months prior to entry and had noted no fever or weight loss. Examination revealed a swollen, hot left ankle and wrist, and right knee—a subcutaneous nodule was present in right elbow region. Laboratory findings were Hbg. 11 gms., uric acid 2.9 mg%, sedimentation rate 46 mm. in 1 hour (Wintrobe).

Treatment with salicylates and physiotherapy produced little benefit. Histological study of the subcutaneous nodule revealed it to be a rheumatoid nodule.

He was seen again six months later with continued disease activity and findings similar to his first study. The serum gamma globulin was found to be elevated. Nitrogen mustard was given 0.1 mg. per Kilo intravenously daily for four days. A marked decrease in joint signs and symptoms occurred. Associated with the improvement the gamma globulin fell (Fig. 1). The remission lasted two weeks following which a return of joint pain, heat and swelling occurred. The gamma globulin was again found elevated.

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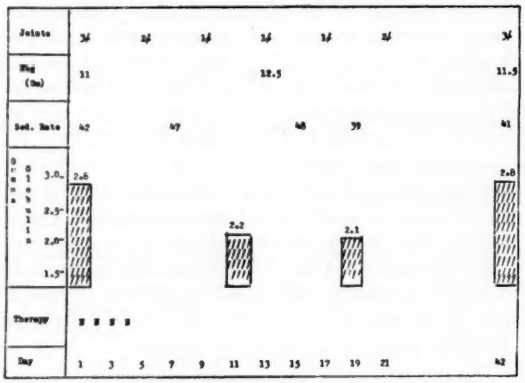

FIGURE 1

E.M. (Case 1) Rheumatoid Arthritis Therapy with Nitrogen Mustard

COMMENT: Moderately active rheumatoid arthritis with control period of six months during which no spontaneous improvement was noted. Therapy with HN_2 resulted in temporary remission and associated fall in gamma globulin. Exacerbation was associated with increase again in gamma globulin.

CASE II E.H.: This 58-year-old white male entered with a three-year history of polyarthritis. On entry there was tenderness and swelling of the wrists and knees, and deformity of proximal interphalangeal joints. A low grade fever up to 100.4° was present. Laboratory findings: Hbg. 13 gms., WBC 12,500 with 80% neutrophils, sedimentation rate 50 mm. (Wintrobe) and gamma globulin 1.9%.

The patient was given nitrogen mustard 0.1 gm. per Kilo daily intravenously for four days. Following this therapy, the temperature became normal and the joint tenderness and swelling disappeared (Fig. 2). He noted a marked increase in sense of well being. Mild aching of the wrists and fingers

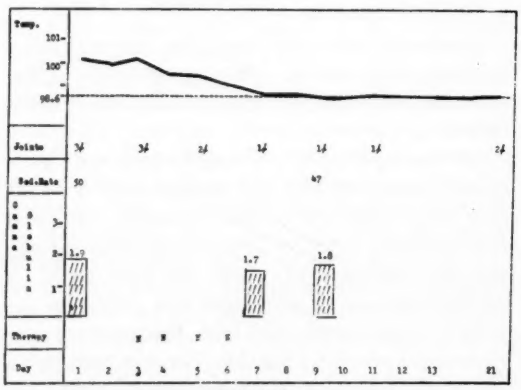

FIGURE 2

E.H. (Case 2) Rheumatoid Arthritis Therapy with Nitrogen Mustard

persisted. This remission lasted for 10 days after which a return of moderate joint pain without swelling or fever occurred. Associated with the remission a fall in gamma globulin occurred which was however, not marked in this case. He has been seen three months later with an exacerbation of rheumatoid activity.

CASE III E.F.M.: A 59-year-old male with 10-year history of back pain. Examination showed limited back motion with flexion deformity. X-rays showed fusion of sacro-iliac joints and typical rheumatoid changes in lumbar and dorsal spine.

Laboratory: Hbg. 10.7 gms., sedimentation rate 33 mm. in 1 hour (Wintrobe), gamma globulin 2.5%.

The patient was confined to bed with pain. He was given nitrogen mustard 0.1 gm. per Kilo intravenously daily for 4 days (Fig. 3). After this therapy the pain diminished and he was able to be up and about. The gamma globulin fell from 2.5 to 0.5% coincident with the clinical improvement. He

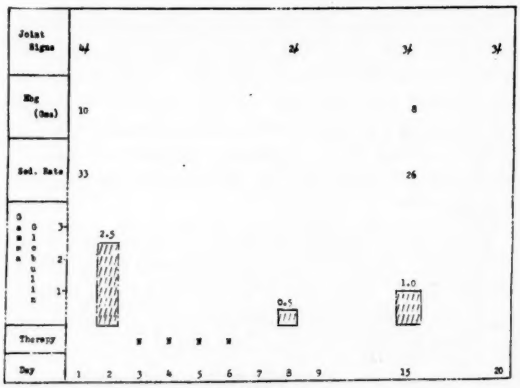

FIGURE 3

E.F.M. (Case 3) Marie-Strumpell Arthritis Therapy with Nitrogen Mustard

was then begun on deep x-ray therapy to the spine.

CASE IV J.P.: This 36-year-old male developed fever and multiple joint swelling and pain in September 1950. The fever varied from 101° to 103°. He lost 30 lbs. in weight. Examination revealed warm, tender swelling of wrist, elbows, proximal interphalangeal joints, knees and ankles. No other abnormalities were noted. Laboratory studies disclosed WBC 20,000 with 87% neutrophils, Hbg. 10 gms., sedimentation rate 55 mm. in 1 hour (Wintrobe). Joint fluid from left knee was sterile and contained 94% neutrophils. EKG was normal.

During a period of one month of physiotherapy, salicylates and supplementary vitamins, no improvement occurred. A course of cortisone was then given for three months during which there was loss of fever and joint pain and swelling. However, upon discontinuing cortisone a prompt relapse occurred to the previous level of disease activity.

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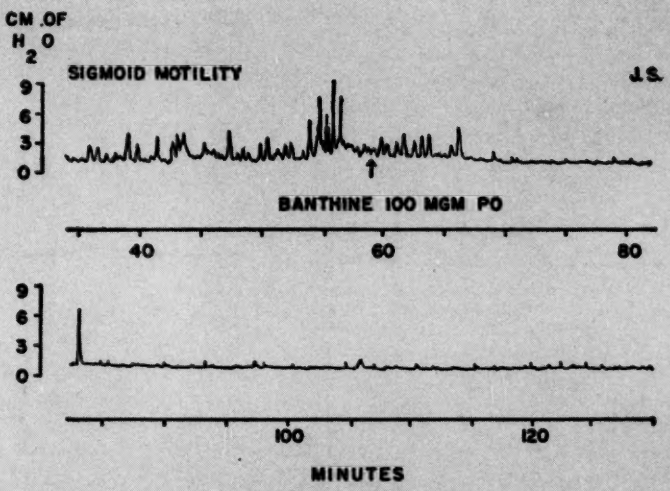

The effect of 100 mg. of Banthine on sigmoid motility. The contractions did not return during the experimental period.[1]

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RESEARCH IN THE SERVICE OF MEDICINE **SEARLE**

ADMINISTRATION OF NITROGEN MUSTARD FOR RHEUMATOID ARTHRITIS

continued from page 612

He was seen again five months later. During the interim the disease activity had continued. He had daily fever, swollen painful joints and more weight loss. In addition, there was beginning flexion contractures of the fingers. Laboratory findings again showed anemia and leukocytosis and elevated sedimentation rate. The gamma globulin was elevated. He received ACTH intravenously (20 mgm. daily over an 8-hour period) for 10 days (Fig. 4). During this therapy he became afebrile—the joints improved markedly. However, the day after ACTH was omitted a prompt spike in fever and exacerbation of joint pain occurred. Three days later nitrogen mustard, 0.1 mg. per Kilo daily for 4 days was given intravenously. A prompt fall in fever and improvement in joint symptoms occurred. The degree of improvement was comparable to that obtained with ACTH. Improvement lasted for one week following which a return of joint pain and heat occurred but less than previously.

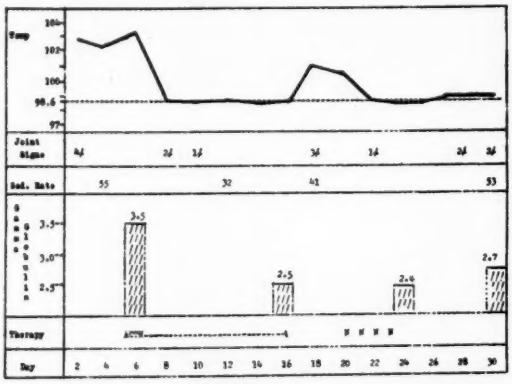

FIGURE 4

J.P. (Case 4) Rheumatoid Arthritis
Therapy with Nitrogen Mustard and ACTH

The patient has been seen again 6 months later in follow-up. He still has considerable disease activity and no permanent improvement has been maintained.

COMMENT: Severe Rheumatoid Arthritis with marked systemic manifestations. Control period of observation was over 1 year during which no spontaneous remissions were seen — cortisone and ACTH gave benefit only as long as the drugs were being administered. A prompt relapse followed their withdrawal. Nitrogen mustard therapy resulted in improvement comparable to the hormones. An associated fall in the elevated gamma globulin occurred. After 7 days a relapse occurred at which time the globulin level was again increased.

CASE V A.M.: This 29-year-old white male developed pain in hips and pain and swelling of knees and ankles 3 years prior to entry. Also had pain in shoulders. Fever up to 102° was present. Examination showed flexion deformities of hips which were marked—also swelling and heat of knees and ankles. Laboratory findings were of Hgb. 9.5 gms., sedimentation rate 53 mm. in 1 hour (Wintrobe).

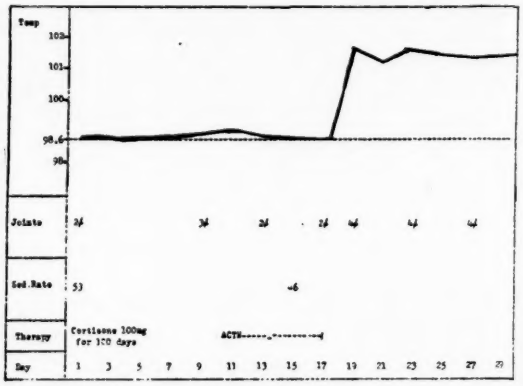

FIGURE 5

A.M. (Case 5) Rheumatoid Arthritis
Therapy with Cortisone and ACTH

For the first 100 days he was given cortisone 100 mg. daily intramuscularly and marked improvement occurred in the fever and joint findings. He then received ACTH, (20 mg. intravenously over 8-hour period) daily for 8 days. Upon discontinuing ACTH, a prompt rise in fever and joint flare-up occurred (Fig. 5).

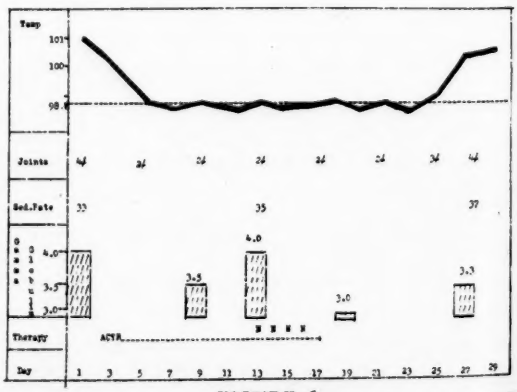

FIGURE 6

A.M. (Case 5) Rheumatoid Arthritis
Therapy with ACTH and Nitrogen Mustard

The patient was then transferred from the Orthopedic to the Medical Service for further evaluation. Determination of the gamma globulin revealed it to be elevated. He was then restarted on ACTH (Fig. 6), which was continued for 10 days.

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ADMINISTRATION OF NITROGEN MUSTARD FOR RHEUMATOID ARTHRITIS

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In addition on the last 4 days of ACTH therapy, nitrogen mustard 0.1 mg. per Kilo was given intravenously. The remission induced by ACTH was prolonged for 7 days following its cessation. This was associated with a fall in gamma globulin from 4.0 to 3.0. The exacerbation of disease activity 7 days later was accompanied with a rise in gamma globulin to 3.3.

A second course of nitrogen mustard was given this patient two weeks later (Fig. 7). Again a fall in gamma globulin (4.3 to 3.9) took place and clinical improvement occurred which was however, by

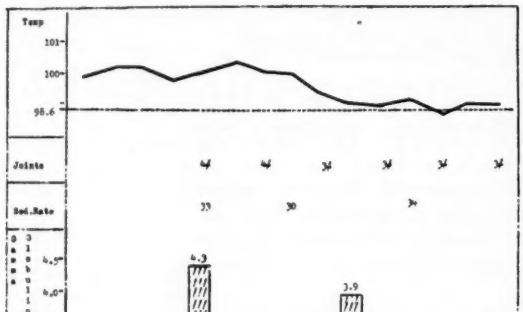

FIGURE 7

A.M. (Case 5) Rheumatoid Arthritis Therapy with Nitrogen Mustard

no means complete. A lower level of disease activity seemed to be present at time of discharge 2 weeks later (than prior to the second course of nitrogen mustard).

COMMENT: Severe rheumatoid arthritis with control period of observation of over 100 days most of which was under cortisone and ACTH therapy. A prompt flare-up of disease occurred when these were omitted. Nitrogen mustard given toward the end of a course of ACTH prolonged the remission when therapy was stopped. A second course produced a similar remission. Both were associated with fall in gamma globulin and the exacerbations with a rise.

RESULTS—Five cases were studied and treated with nitrogen mustard. In all the serum gamma globulin level was elevated. Two cases were given ACTH for 10 days to two weeks prior to nitrogen mustard therapy. ACTH produced no consistent effect on the serum gamma globulin level. In one case there was an initial fall followed by a rise to the original level. In the other a decrease in the serum gamma globulin level was noted. Those who have studied this point have had similarly variable results.[24]

Following nitrogen mustard there was a drop in the serum gamma globulin. In general the fall was greatest in those cases whose initial gamma globulin level was highest. Coincident with the fall in the gamma globulin a clinical improvement in the disease manifestations took place. In some cases the degree of improvement was as striking as that seen with ACTH. The duration of the improved state following the nitrogen mustard varied from one to two weeks. This was in contrast to the prompt relapse noted following cessation of ACTH and cortisone. Relapse was associated with return of the serum gamma globulin to higher levels.

COMMENT—The facts that appear to deserve emphasis are: 1. Administration of nitrogen mustard was followed by a decrease in the serum gamma globulin. 2. Coincident with this fall a clinical change in the disease process took place. 3. Clinical relapse was associated with return of the gamma globulin to a higher level. These findings seem to implicate the gamma globulin, its components or tissue producing it as a factor in the pathogenesis of rheumatoid arthritis. This is in agreement with the concept recently expressed by Ehrich[25] in which he termed the collagen diseases the "dysgamma globulinemias". Whether an antigen antibody reaction is involved and has been altered by the nitrogen mustard cannot be stated with certainty at the present time.

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DISTRICT MEDICAL SOCIETY MEETINGS

PROVIDENCE MEDICAL ASSOCIATION

A regular meeting of the Providence Medical Association was held on Monday, October 6, 1952 at the Rhode Island Medical Society Library. The meeting was called to order by the President, Dr. Frederic J. Burns, at 8:35 p.m.

The reading of the minutes of the preceding meeting was omitted in view of the fact that these minutes had already been published in the *Rhode Island Medical Journal.*

The President reported that eight members of the Association had died since the April meeting. He called for a moment of silent prayer in memory of these physicians.

The President reported on October medical meetings, including the Dr. Isaac Gerber Oration to be held on October 22.

Dr. Nicola DiPalma, elected to membership at the April meeting of the Association, was awarded his membership certificate by Dr. Burns.

The President publicly thanked the General Electric Company for its kindness in loaning a fluoroscope for the meeting this evening.

The Secretary reported that the Executive Committee recommended for election to membership the following physicians: Philip Baron, Arthur M. Dell, Peter Fratantuono, John W. Geoghegan, Vincent I. MacAndrew, Peter L. Mathieu, Jr., John F. McGuire, Anthony J. Rotelli, Richard P. Sexton, George C. Smith, Gerald Solomons, Mario Vigliani, and Elihu S. Wing, Jr.

It was moved that these physicians be elected to active membership. The motion was seconded and adopted.

The President introduced Dr. Charles A. Hufnagel, Professor of Experimental Surgery, and Director, Section on Cardiac Surgery, Georgetown University Medical Center, Washington, D. C., who spoke on "The Experimental and Clinical Correction of Valvular Cardiac Lesions."

Dr. Hufnagel's introductory remarks pertained to the recent advances in general cardiac surgery. In his talk he detailed the surgical treatment of mitral stenosis, pulmonary stenosis, aortic stenosis and aortic regurgitation. He spent considerable time on the treatment of mitral stenosis. He listed the indications for operation on the mitral valve as follows:

1. Pure mitral stenosis
2. Limitation of activity
3. Under 45 years of age
4. No major aortic involvement

Factors influencing the prognosis but not contraindicating operation were listed as follows:

1. Auricular fibrillation
2. Peripheral embolization
3. Repeated hemoptysis
4. Known congestive failure

Definite contraindications to surgical treatment of the mitral valve were listed as follows:

1. Acute rheumatic fever
2. Uncontrollable congestive heart failure
3. Subacute bacterial endocarditis
4. Concomitant disease with a less favorable prognosis, for example, renal disease
5. Other unfavorable valve lesions

In his talk Dr. Hufnagel also presented some experimental material on Tetralogy of Fallot and atrial septal defects.

The last portion of the program was devoted to a description of an artificial aortic valve. He demonstrated this in one of his experimental animals which was flown to Providence from Washington. The operation of the plastic valve was demonstrated with the assistance of a fluoroscope.

The paper was discussed by Drs. Beardsley, Eddy, and Curran.

Attendance 92.

Meeting adjourned at 10:45 p.m.

Collation was served.

Respectfully submitted,
MICHAEL DIMAIO, M.D., *Secretary*

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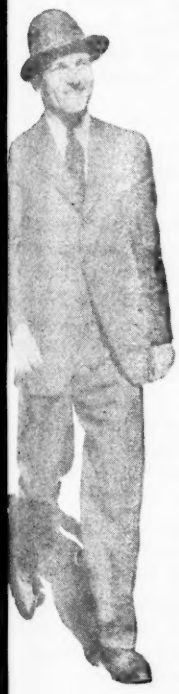

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PRESENT DAY CONCEPT OF RHEUMATOID ARTHRITIS

concluded from page 600

in which there is a degeneration of the ground substance of the connective tissue.

(2) In rheumatic fever there is an increase in activity of the enzyme hyaluronidase which is responsible for the alteration of the ground substance.

(3) In rheumatoid arthritis, the tissue-fixation of antibodies is offered to explain the pathogenesis of this disease.

(4) The incidence of cardiac involvement in cases of rheumatoid arthritis bring about a striking similarity between it and rheumatic fever.

(5) The changes in the protein metabolism in rheumatoid arthritis and rheumatic fever are a great diagnostic aid in the evaluation of the arthritic patient.

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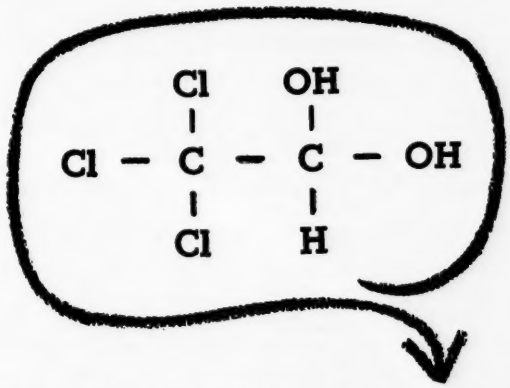

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HOUSE OF DELEGATES
of the
RHODE ISLAND MEDICAL SOCIETY
Report of Meeting Held October 1, 1952

A MEETING of the House of Delegates of the Rhode Island Medical Society was held at the Medical Library on Wednesday, October 1, 1952. The meeting was called to order by the President, Dr. Albert H. Jackvony at 8:20 p.m. The following were in attendance:

Kent County
Stanley Davies, M.D.
Peter C. Erinakes, M.D.

Newport County
John E. Carey, M.D.

Pawtucket District
Stanley Sprague, M.D.
Henry E. Turner, M.D.

Woonsocket District
Saul A. Wittes, M.D.

Bristol County
Charles Dunbar, M.D.

Officers of the RIMS
Albert H. Jackvony, M.D.
Thomas Perry, Jr., M.D.
Earl F. Kelly, M.D.

Providence Medical Association
Charles J. Ashworth, M.D.
J. Murray Beardsley, M.D.
Frederic J. Burns, M.D.
Francis H. Chafee, M.D.
Frank B. Cutts, M.D.
William P. Davis, M.D.
John A. Dillon, M.D.
Michael DiMaio, M.D.
William J. H. Fischer, M.D.
Peter F. Harrington, M.D.
Louis I. Kramer, M.D.
Robert G. Murphy, M.D.
Joseph C. O'Connell, M.D.
Alfred L. Potter, M.D.
Louis A. Sage, M.D.
Daniel V. Troppoli, M.D.
George W. Waterman, M.D.

Executive Secretary
John E. Farrell, Sc.D.

REPORT OF THE SECRETARY

Dr. Thomas Perry, Jr., Secretary, reported on actions taken by the Council since the previous meeting of the House of Delegates, as follows:

1. It continued the Society's membership in the Council of the New England State Medical Societies.
2. It approved of publicity be given in the *Rhode Island Medical Journal* of the American Medical Association memorandum on the subject of gamma globulin.
3. It recommended that editorial comment on the American Medical Education Foundation be prepared for the *Rhode Island Medical Journal,* and that members of the Society be urged to direct donations to their particular medical schools through this Foundation.
4. It approved of the drafting of a resolution regarding the World Medical Association for submission to the House of Delegates.
5. It approved of the investment of $5,000.00 of the Society's funds in accordance with recommendations made by the Trust Committee of the Industrial Trust Company handling the account, and it also approved the sale of certain investments and the re-investment of the money secured in new stocks.
6. It unanimously supported the President of the Society in his action in objecting to part of a brochure issued by the Department of Labor regarding the Curative Center.
7. It authorized the Chairman of the Committee on Public Policy and Relations to suggest an outline for a public relations program for the coming twelve-month period.
8. It authorized the publishing as a separate memorandum to the membership the legal opinion on "Abortion and Sterilization Procedures Under the Rhode Island Law" as prepared by the Society's legal counsel.
9. It approved of the publishing of a letter by the President of the Society to the membership urging support of the Community Fund Campaign of 1952.
10. It authorized the President of the Society to appoint a Medical-Pharmaceutical Committee.
11. It approved a proposal to determine the feasibility of an Inter-Professional Council to consist of representatives of the medical, dental, pharmaceutical, nursing, and legal associations, and it recommended that the President take appropriate action to initiate the formation of such a Council.
12. It authorized the Officers of the Society to plan a conference for the office personnel of physicians, to be held in the Fall of 1952, at a time and place to be decided by the Committee.
13. It authorized the use of the Miller Room on October 21, 1952 for a meeting of the Rhode Island Association of Clinical Laboratories.
14. It referred to the Committee on Nutrition, with instructions to report back to the Council, a suggestion by the State Department of Health for a series of classes in connection with a weight control program.

continued on page 624

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Each fluidounce contains:

Kaolin	90 grs.
Pectin	2 grs.

Available in 10 fluidounce bottles.

Dosage: Adults—½ or more tablespoonfuls after each bowel movement or as indicated.

Children—1 or more teaspoonfuls according to age.

*Trademark, Reg. U. S. Pat. Off.

Upjohn *Medicine . . . Produced with care . . . Designed for Health*

THE UPJOHN COMPANY, KALAMAZOO, MICHIGAN

HOUSE OF DELEGATES

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15. It referred to the Committee on Industrial Health a communication relative to a possible study of the present extent of chemically contaminated foods.

16. It approved and endorsed the New England Diabetes Association Fair to be held in Boston, November 14-15, 1952.

17. It approved of the initiation of two recommendations submitted by the Chairman of the Committee on Diabetes in connection with this program for 1952.

18. It approved the recommendations of the Committee on Public Relations and authorized the Committee to issue special releases or utilize space in the *Rhode Island Medical Journal* in connection with its work.

19. It went on record as supporting the action of the Committee on Public Relations regarding press stories involving medical certifications under the benefit programs of the Department of Employment Security of Rhode Island, and it instructed the Committee, through its Chairman, to act in the best interests of the Society in resolving the matter, and to issue the explanatory statement to the press as presented and read to the Council.

20. It received and approved the report of the Treasurer including the proposed budget for the Society for 1953, and a complete statement on the invested funds of the Society, and it moved that the budget as proposed be submitted to the House of Delegates for its approval.

21. It authorized the President of the Society to appoint a committee to study the question of group life insurance and retirement programs for the membership.

22. It ruled that non-members of the Society shall not be eligible for participation in the Society's group plan for Physicians Service and Blue Cross benefits.

* * *

Action—It was moved that the report of the Secretary be received and placed on file. The motion was seconded and adopted.

Recommendations to the House of Delegates

The Secretary reported the following recommendations from the Council to the House of Delegates:

1. The Council recommends for approval by the House of Delegates the proposed budget submitted by the Treasurer for the Society in 1953, and the establishment of annual dues at $40 for members

in practice more than one year, and $25 for members in their first year of practice.

Action—It was moved that the recommendation of the Council be adopted. The motion was seconded and adopted.

2. The Council recommends the election by the House of Delegates of Dr. Charles L. Farrell, of Pawtucket, and Dr. Charles J. Ashworth of Providence, as delegate and alternate delegate, respectively, from the Society to the House of Delegates of the American Medical Association for 1953 and 1954.

Action—It was moved that the recommendation of the Council be adopted. The motion was seconded and carried.

3. The Council recommended that a resolution be prepared for submission to the House of Delegates endorsing the World Medical Association. The Secretary read the prepared resolution, which is made a part of the official minutes of the meeting.

Action—It was moved that the resolution regarding the World Medical Association be adopted. The motion was seconded and carried.

Recommendation from the President

Dr. Albert H. Jackvony, President of the Society, reported on the work of a State Development Council relative to the improvement of the structures at the State Institutions. He urged that the House of Delegates give consideration to the endorsement of a proposed $3,000,000 Bond issue to be voted on at the next election to provide for construction of needed buildings at the State Institutions.

Action—It was moved that the House of Delegates endorse the recommendation of President Jackvony regarding the bond issue for the State Institutions. The motion was seconded and carried.

Report of the Treasurer

In the absence of the Treasurer his report was submitted by Dr. John A. Dillon, Assistant Treasurer.

Dr. Dillon reported for Dr. Gauthier as follows:

"In accordance with the by-laws I have submitted to the Council this month an estimated budget for the Society for the year 1953. As in the past this budget is prepared on the basis of current and past expenditures. Every effort is made to anticipate the cost of operation a year hence, and in submitting the estimates it is with the understanding that they are approximate and may increase or decrease according to the economic conditions in 1953.

"As my predecessor noted in his annual report our annual income has been fairly consistent, but the dues exemption granted amounts to approximately $3,400 annually. We have had no sizable

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increase in salaries in years, but other expenditures have increased in the past five years due to inflation.

To meet the proposed budget the dues for 1953 must equal the assessment of 1952.

Together with the estimated budget I have included with this report a statement of our investments as reorganized and expanded during the past six months."

Dr. Dillon then summarized the proposed budget for 1953 as approved by the Council of the Society.

Action—It was moved that the report of the Treasurer be received and approved. The motion was seconded and adopted.

* * *

Dr. Dillon also reported that the Society is a legatee under the will of the late Dr. Louisa Paine Tingley. He stated that books and historical data regarding Dr. Caleb Fiske had been bequeathed to the Society, and in addition Dr. Tingley had provided that upon the death of three legatees who are to receive cash annuities for their lifetime, the Society is to receive bequests as follows: 2% of the remaining funds to the Society for the Endowment Fund, the interest to be used only.

Report of the Committee on the Use of Hospital Accident Rooms

Dr. Peter Erinakes, chairman of the committee on the use of hospital accident rooms, reported as follows:

"At the Delegates meeting of January 18, 1952, a discussion arose on the floor as to the effect the Blue Cross and Physicians Service Plans were having on the operation of the Emergency Rooms in the Hospitals of Rhode Island. The motion was made and passed that the President name a committee to report individually by letter before the next meeting. The individual reports were discussed at the April 28th meeting and since there were no recommendations from the committee as a whole, a chairman was appointed to report such recommendations at the next meeting.

1. Representatives of Blue Cross state that they will review cases treated in accident rooms and proposed to pay for bonafide emergency cases only.
2. Physicians Service will pay licensed physicians for services rendered.

As the number of insurance plans increase, the number of compensable cases will increase also. Thus in time the operation of the accident room will probably become highly profitable for the hospital and physicians, and some method must be adopted to cope with the situation and insure its operation in an ethical manner.

RECOMMENDATIONS

1. Because the diversity of problems in each hospital require individual approach, all hospitals in Rhode Island are asked to appoint permanent Emergency Room Committees to handle the problems arising.
2. Especially encourage the physicians starting practice to place their names on call lists in the emergency rooms to supplement the men on call in the various services. (Make greater use of the general practitioner.)
3. All doctors are encouraged to join local emergency lists and thus decrease the number of patients seeking treatment at accident rooms.
4. The problem be referred to the Committee on Medical Economics for continued study and recommendations."

* * *

There was discussion of the report.

Action—It was moved that recommendation 4 in the report be amended to read that the problem be referred to the Committee on Hospitals and Professional Relations rather than to the Committee on Medical Economics. The motion was seconded and adopted.

It was moved that the report and the recommendations therein be adopted by the House. The motion was seconded and adopted.

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Executive Session

Dr. Joseph C. O'Connell moved that the House go into Executive Session. The motion was seconded and adopted.

* * *

GENERAL SESSION

At the conclusion of the executive session the House reconvened in general session, and Dr. Jackvony called for the report of the committee on public policy and relations.

Report of the Committee on Public Relations

Dr. Clifton B. Leech, Chairman of the Committee on Public Relations reviewed the recent situation resulting from unfavorable publicity regarding medical certification under the Cash Sickness Compensation Program. He suggested that the Society consider initiating legislation whereby medical information on questionable claims, including the name of the physician involved, could be submitted to the Society for investigation.

Action—It was moved that legislation be drafted to provide for an amendment to the Temporary Disability Compensation Act whereby information regarding physicians and medical certification can be submitted to the Rhode Island Medical Society for investigation, and that any such legislation drafted be submitted to the House of Delegates for its approval or otherwise. The motion was seconded and adopted.

Greetings for Dr. Charles L. Farrell

Dr. Jackvony noted that Dr. Charles L. Farrell, the Society's delegate to the A.M.A., was to be inducted as President of the American Association of Physicians and Surgeons at its annual meeting in Denver, Colorado on Thursday, October 2.

Action—It was moved that the House of Delegates unanimously extend its felicitations and best wishes to Dr. Charles L. Farrell on his election as President of the American Association of Physicians and Surgeons and that the Secretary notify him of the action of the House.

The motion was seconded and unanimously adopted.

The House adjourned at 11 p.m.

Respectfully submitted,

THOMAS PERRY, JR., M.D., *Secretary*

BOOK REVIEWS

THE CLINICAL USE OF FLUID AND ELECTROLYTE by John H. Bland. Philadelphia, Pa.: W. B. Saunders Co., 1952. 259 pp. $6.50.

This book is probably the most complete and up-to-date review now available of this important subject. Following a presentation of basic physiologic considerations, the author, in separate chapters, discusses fluid and electrolytes in congestive heart failure; pediatric patients; geriatric patients; surgical patients; renal disease; diabetes; and adrenal cortical insufficiency. There are also chapters on ACTH and Cortisone and the adverse effects of heat, cold, shock, burns, crush, blast injury, and roentgen irradiation.

Many charts are presented showing electrolyte patterns of both intracellular and extracellular fluids for the various pathological conditions. Unfortunately, it is not clear whether the intracellular patterns represent actual concentrations based on muscle biopsy or hypothetical concentrations based on fluid balance studies.

Each chapter is rather complete in itself and, for this reason, there is considerable repetition throughout the book. The repetitive, rambling style text, combined with an 8½x11 inch format and the lack of an index, renders the book unsuitable for quick reference purposes. It should prove most valuable to those who wish a collection of critical reviews, each fully supported by references to the literature.

WENDELL T. CARAWAY, PH.D.

THE TREATMENT OF INJURIES TO THE NERVOUS SYSTEM by Donald Munro, M.D. W. B. Saunders Company, Phil., 1952. $7.50.

Over 30 years experience in handling patients in one of the busiest and most specialized clinics for neurological trauma forms the basis of Dr. Munro's testament comprising 284 pages of clear and coherent sentences and solid paragraphs. Systematic subdivision of the contents guides the reader directly to compartmented categories of the eight chapters. The text is so cross-referenced that there is no ambiguity on interrelated subjects. The illustrations represent carefully selected visual aids rather than embellishments. Included are concise directions for performing diagnostic and operative procedures with requisite equipment listed and valuable advice for hospital administrators, trustees, and families of patients.

Craniocerebral and spinal cord injuries contribute the major molds of the volume, shaped from entirical progress since World War II. The pathophysiology of the cord is especially well-presented —notably in its autonomous potentialities for functional restitution if extraneural complications are anticipated and overcome. Ultimate goals are affirmed in close proportion to the immediate objects of day-to-day care.

The perfection called for here in the treatment of neurologic injuries is unattainable in any but the most specialized clinics; but adherence to proven precepts of early management is shown to be the only means to ultimate goals. Many of the instructions are negative admonitions—what not to do, i.e. the critical "lumbar puncture". They are properly written for the general practitioner and surgeon who must decide what he can or cannot accomplish and how to proceed until experienced help can be obtained. Dr. Munro is at his best in formulating such important tactics.

Neurosurgeons will not agree that trauma comprises the only rewarding field of their specialty. They may find the section on peripheral nerve surgery and the pain syndromes inadequate; and they may criticize the lack of discussion on such aspects as the biochemical, electro-physiological and psychiatric effects of injury to the nervous system.

This book does not permit etiological theory to cloud the issue of active therapy. Its chief value lies in a factual and practical approach. It should be widely read and widely used.

HANNIBAL HAMLIN, M.D.

SPONTANEOUS RUPTURE OF THE ABDOMINAL AORTA

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